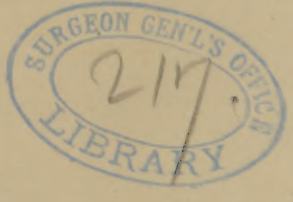
Richey (S.O.)

Prevents

Deterioration of Vision

—IN—

SCHOOL CHILDREN.



DETERIORATION

OF

VISION IN SCHOOL CHILDREN.

BY

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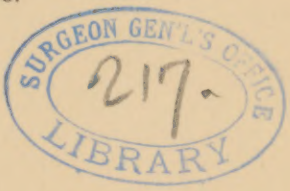

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DETERIORATION OF VISION IN SCHOOL CHILDREN.

Wherever "two or three are gathered together" a legitimate field is created for investigation by those interested in the moral and physical welfare of their race,—because one may be in health and another diseased, the former, in time, being "made black by handling pitch." If the hygienic arrangements of private houses, barracks, ships, and hospitals are studied, so should be those of theatres, churches, and schools.

Schools are to a great degree protected from the more pronounced contagious diseases, but are they guarded so well as they might be from those that are obscure and less easily detected? Should not each school be ensured all possible safety by a preliminary physical examination in every respect of each child entering it? A certificate of vaccination is demanded of each new comer in many schools. When any of the eruptive fevers are known to exist in a household, no child from that house is allowed to attend until all danger of contagion is believed to be past; but how many there are, especially among the poorer classes, who have some conjunctival affection, and yet attend the schools, associate intimately with those who have not, use the same wash-basin and towel, the same books and pencils! The extent of exposure is not justifiable, and a certificate of health in this particular is as important as in any other.

[1]Reich had an experience due, probably, to exceptional circumstances, but among three hundred and seventy school children in Armenia he found trachoma to exist to the extent of thirty per cent. of the males and twenty per cent. of the females; and there was conjunctival trouble of some character in sixty per cent. of the males and seventy-three per cent. of the females.

Weber suggests that a special physician be appointed with executive authority. This would meet the difficulty at the outset, but it would add to safety to banish wash-basins and towels from the school-room unless each pupil could have his own towel. This last recommendation will not seem uncalled for by those who have seen instances in which the different members of the same family have suffered in a like manner, the source being a single individual and the medium of communication the articles in common use. A low form of granular conjunctivitis, with its train of consequences, trachoma, distortion of the lids, and paunus, is

[1] C. f. A. Oct., 1878, p. 228.

much to be feared. I have never seen it happen in a very young child but once: it is not infrequent after eight years of age. Landesberg states (Archiv. Oph. vol. vj, p. 487) that he has "seldom seen children under five years suffering with granular conjunctivitis." An affection of the eye due to contagion is an accident not attributable to the work of the school-room; but there is another form of trouble which cannot justly be characterized as accidental, because of the constancy with which it prevails among all schools; a shifting or varying in the power of refraction of the eyes, the refraction increasing as the eyes are kept at close work for a long time. This condition of near-sight will in time be as much a curse to civilized people as tuberculosis, uniting as it does the influences of inheritance and acquisition. Germany to-day probably heads the list in the per-centage of myopia to its population, especially among its educated people. That country has also been among the first to appreciate the greatness of the evil, in that it disqualifies in a great measure those who have it for military duty, and therefore for good and efficient citizenship. We, in our neglect or in the inadequacy of the measures adopted, are rivalling her in our results.

Hygiene will be the medicine of the future, and Prophylaxis the patron saint of physician and layman alike. More is to be gained for our race by avoiding now, when it is possible, the sins which will be sure to curse our children, than by all the measures of relief they can reach. The sage contemplates the probabilities of the future, and endeavors to prepare for them. The fool lives in the present, with a selfish regard for himself alone: he drinks his wine to excess, regardless that his offspring must pay to Nature his debts in pain, blindness, general infirmity, and shortened life. A debauch is such, whatever form it may take. No one disputes that excessive guzzling is dissipation. Over-sleep, over-exercise, anything which exceeds the limits nature has fixed, and which does not give to employment the variety that charms and rests, is debilitating, and in so far adds a burden to those who come after us. The overtaxing of any organ makes it tired—a street synonym for drunk. Our moralists inveigh against intoxication by drugs, and yet often encourage that of exhaustion, probably not realizing one to be as bad in its effects as the other. How often does one see this individual at his work, giving testimony against excesses, while himself exhibits the pallor and exhaustion of late hours, hard work, and mental anxiety, the result of which is felt by the child born of his wearied body. He forgets this possibility, and that the Book from which he often gets his inspiration says, "The sins of the fathers shall be visited upon the children, even unto the third and fourth generations." Others, with this example, are inclined to act in the same manner. The children of these individuals begin the work of life handicapped, and their school life at a very early age. They must contend with the offspring of more vigorous parents, and to keep abreast must make greater effort. The working organs are forced to labor beyond that which allows of health, and structure change follows. The bow is never unbent, and it breaks. With longer persistence come greater

changes and increased disqualification, which in turn are handed down to their own children, who then have the burdens transmitted by the father and the grandfather. As living means struggling, there is rarely an opportunity to retrace our footsteps; therefore we must go on, and, moving on, struggle at a greater disadvantage with each succeeding generation, so the end of such a family can be easily predicted, because the evil influence accumulates by geometrical progression.

What is said of a family is true also of a race, except that the causes are in greater variety and intensity, and require a longer time, though the ultimate conclusion must be the same. Let the organ of the body which shows this tendency to depreciation be what it may, the best method of procedure is that of *prevention*. The ills which our bodies suffer were probably not existent at first, but are the outcome of a long series of indulgences by our fathers. We should hold *them* responsible for them, and ourselves accountable for any addition to them which may be manifested in our children. We should not be profligate in study, more than in other things. It is selfish to ourselves to enjoy our patrimony, to spend it all, and then to propagate children who will inherit from us nothing but ills.

Though myopia may not exist in a given instance, the tendency may be inherited; and if any ancestor has had near vision, the precautions against it should be increased. We have here to discuss school work as a probable cause in the production and increase of myopia, and the best means to prevent or lessen it, if possible.

A small proportion of very young children in this country have a high degree of myopia, which is inherited, and these must be excluded from the discussion.

It is not infrequent that the individual begins as a hyperope, the refraction increasing to emmetropia (or normal refraction), and myopia, progressive myopia. The statistics, which are large enough for conclusions, show, in our own and in foreign schools, a gradual increase in the percentage of myopia from the lowest to the highest classes. The persistent use of the eyes at short range upon objects improperly illuminated, or for other reason insufficiently distinct, are believed to be the prominent factors in its production.

Dobrolowsky, in examining the children of the Ural high school, finds myopia infrequent—12 per cent. of the whole. These children live much out of doors, and their high animal spirits no doubt so much diminish their taste for mental work, that they do less of it than many others.

Compare the above with what follows: Durr reports, that among the scholars of the II Lyceum, Hanover, in the lowest class, there are 15 per cent. near sight, and 94 per cent. in the highest, with a mean of 37.7 per cent. In the lowest class there was 81 per cent. of hyperopia, allowing only four per cent. for normal refraction.

Reich found, in a girls' school, 12 per cent. myopia in the lowest class and 53 per cent. in the highest, with an average of 33 per cent.

Dunnert examined 1,133 pupils of Hyde Park schools: 76 per cent. were normal; 12 per cent. of the rest were hyperopic, 8 per cent. myopic, and four per cent. miscellaneous. Only 18 per cent. under ten years had eye-trouble. Among those over fifteen years emmetropia was exceptional. Myopia increased *from 3 per cent. between 5 and 10 years, to 30 per cent. between 15 and 20 years,—ten times.*

[1]Zehender, in his examinations, found nearly 11 per cent. myopic in the sixth or youngest class; in the fifth class, 16 per cent.; fourth, 33¼ per cent.; third, 36⅔ per cent.; in the second, 33⅓ per cent.; and in the first, 41.38 per cent.;—making an average of about 28.6 per cent.

[2]Agnew examined 1,479 students. The ratio of myopia increased with the grade of the school, as in the previous statements reaching an average of 28.8 per cent., nearly corresponding with the report of Zehender. In the district schools 10 per cent. were myopic; in the normal high schools it reached 16 per cent.; in the intermediate school, 14 per cent. In the New York college, Introductory class, the myopia was 29 per cent.; in the Freshman class, 40 per cent.; in the Junior, 56 per cent.; and in the Senior, 37 per cent. At the Polytechnic Institute, Brooklyn, the myopia was 10 per cent. in the academic and 28 per cent. in the collegiate departments.

[1]Cohn, among 9,344 pupils, found the ratio of near vision to increase from the lowest to the highest class. In the sixth class the per-centage was 22; in the fifth, 27; fourth, 36; third, 46; second, 55; and in the first, 58;—making an average of the whole nearly 39 per cent. Among 1,004 myopes, only 28, or 2.7 per cent., had a myopic father or mother.

These figures are not all, but they are sufficient to show the tendency of the eyes doing the necessary work at school to be in the direction of *increased* refraction.

A variety of measures, somewhat conflicting in certain respects, have been suggested for the purpose of preventing or limiting as much as possible the changes in refractive power. [3]Von Reuss claims that in early life the curvature of the cornea is greater, and that it lessens until the seventh year; that after the twelfth year the curvature again increases. The child is sent to school at a very early age (sometimes at four years in Germany, and at five or six years in America), when the tissues are forming, and are more susceptible, because of their pliability, to outside influences than they would be a few years later. His school days cover the period of second dentition, at which time the nutrition of the region of the trigeminus is much disturbed. His eyes are not yet accustomed to forced labor, and every deleterious circumstance makes the most of its opportunity. Constant labor, for from four to six hours a day, at close objects, often in themselves indistinct, with poor or badly regulated illumination and ventilation, enforced tiresome position, an existing slight error of refraction uncorrected, are some of the deleterious circumstances.

[1] *Rostock Gazette*, February, 1880.
[2] *New York Med. Record*, 1877, xij, p. 34.
[3] A. f. O. Bd. xxvij.

Weber, in his report on the higher schools of Darmstadt, recommends that the light should come from a point as high as the heads of the pupils standing up; that the benches should vary in size with that of the pupil; that the work should not be continued for more than forty-five minutes at a time, fifteen minutes being given to exercise; that the teachers be required to see that the work be held fifteen inches from the face; that a special physician be appointed, with authority to enforce these requirements.

[1]Derby suggests that each pupil be tested every six months by the teacher, that a very early knowledge may be had of the condition, in order that he may be treated, and progressive myopia avoided. In my opinion, it will be better if children are not permitted to attend the public schools until the age of second dentition is past, as the rapid progress their more matured minds will make will compensate for the time apparently lost, while they will gain in bodily vigor, and the eyes will be in a more settled condition, structurally and functionally. Objection is made by good[2] authority to all work requiring close vision for young children, giving as a reason that they often leave the kindergartens myopic.

Hasket Derby's views, with regard to the examination of the eyes every six months, are good. The teacher might easily test the distant vision when the child enters the school; then once in six months, and the record would be useful to the child and to school statistics. Becoming a part of the school history, it would show the progress of each individual, as well as the changes from class to class.

The character of the materials used in the school-room has been discussed with some freedom, and with varying conclusions. Malarewsky commended to the Russian Society of Hygiene white letters upon a black background. Cohn prefers the use of white slates, as they do not reflect, and the characters made upon them can be seen farther. Horner advises that ink and paper be substituted for slate and pencil.

The effect of the various methods of writing has been studied, and with not greater unanimity of opinion as to what is important, or the kind of characters and the background which are most conservative. [3]Berlin thinks slanting penmanship is the best method, the angle of the down-stroke with the perpendicular line being about 35° to 40°; that the vertical system requires more muscular exertion of the arm, and forces an oblique position upon the child. Schubert opposes the slanting system of penmanship in schools, because he thinks the difference in distance of the point of fixation of the two eyes might produce anisometropia, squint, loss of binocular vision, and loss of visual power, by causing unequal accommodation.

Manz, of Freiburg, objects to inclined writing, for the reason that it may assist in the causation of myopia by the unnatural attitude of the head. Ellinger thinks the inclined method favors myopia. Königshöfer

[1]*Boston Med. & Surg. Journal*, June, 1880.
[2]Berlin and Rembold,—"The influence of writing on the eyes, and the attitude of children."
[3]Archiv. fur Ophth., vol. xxvij, p. 259, and Ref. to Heidelburg Ophth. Soc., 1882.

does not agree with Berlin. He thinks the direction of the writing is not important; that the laws of the movements of the eyes act very slightly during writing; that the attitude is controlled by the desire for ease of the hand.

It occurs to me that the greatest danger is not to be found in the original work done by the pupil, as in writing on a slate or blackboard, but it exists in the effort he makes to get at the thoughts of others as expressed in print, keeping his eyes fixed upon the same character of type for a long time without relaxation. Much more, in my judgment, is to be feared from the glazed paper, the type, unvarying in size and color, of the school text-books, read by bad light, with the body wearied by the overtaxing incident to our hot-house method of education, which so often *unfits* its victims for success in anything in after life, than from any method of penmanship whatever. Less mental work, more mental and physical recreation, with some variety in the images upon which the eyes are fixed, and in the distance of such images from the eyes, will do much to obstruct the progress of the affection under discussion.

I would suggest, in conclusion, that in the arrangement of our school-books we should endeavor to follow the teachings of Nature, who offers us, instead of plain surfaces and flat objects, broken surfaces and objects differing in color, giving change in form, distance, and color. Instead of a white surface with black letters, or white letters upon a black background, it would save effort on the part of the eye if the school-books were made with raised or embossed letters, varying in color, printed upon an unglazed neutral surface. Thus direction of light would have less importance.

With even surfaces, and single colored flat objects, the ciliary muscle is kept in tonic spasm instead of in healthful play, and, like any other muscle when compelled to move in a fixed direction with measured force and regularity, it becomes less fitted for other efforts, like the man who has been walking over plowed ground for a whole day, who will lift his feet unnecessarily high when walking upon a pavement immediately afterwards. Thus we have myopia acquisita from setting the ciliary muscle for objects at a given near point for a long time, and the recti muscles, being required to maintain great convergence, press upon the bulb and lengthen its antero-posterior diameter. A plain surface gives the idea of fixed distance, and a great extent of snow or sand gives in nature the persistent color, unchanging light—intensity, and unbroken surface, the effects of which are so familiar to us.